

Limited availability of global health opportunities in US orthopaedic trauma fellowship programs

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Abstract

Purpose: Orthopaedic residents are increasingly seeking international health electives (IHEs) during training, and many such experiences involve providing orthopaedic trauma care. However, little is known about the availability of IHEs during orthopaedic trauma fellowship training. The purpose of our study is to assess the global health opportunities available to US orthopaedic trauma fellows.

Method: We conducted an online, Research Electronic Data Capture (REDCap)-based survey of orthopaedic trauma fellowship program directors (PDs) in the United States. The survey link was sent by the Orthopaedic Trauma Association (OTA) Fellowship Committee to all US OTA-approved orthopaedic trauma fellowship PDs. Follow-up reminder e-mails were delivered at set time intervals from baseline over a period of 4 weeks.

Results: The overall response rate was 80% (43/54). Only 3 of 43 responding programs (7%) offer a structured global health program, but over the last 10 years, 12.5% of the remaining programs (5/40) have had a fellow participate in an IHE during fellowship training. Around 100% of PDs reported fellow satisfaction with their IHEs, and all PDs agreed that the educational experience provided by their fellows' IHE participation was valuable. Among programs with no recent fellow IHE participation and without a structured global health program, 9% of PDs (3/35) expect to institute such a program. Lack of funding, lack of established international partner sites, and fellow time away were the most common perceived barriers to IHE participation. A total of 54% of PDs agree that participation in an IHE during training plays a major role in shaping fellows' future professional and volunteer activities.

Conclusion: There are limited global health opportunities among US orthopaedic trauma fellowship programs, with only 7% (3/43) offering a structured global health program. Perceived barriers include lack of funding, lack of established partner sites, and concerns related to clinical/call coverage. Greater efforts to establish sustainable funding and international partnerships may increase opportunities for IHEs during orthopaedic trauma fellowship training.

Keywords: fellowship training, global health, orthopaedic trauma, volunteering

1. Introduction

Traumatic injuries account for a significant portion of the global burden of musculoskeletal disease, and low- and middle-income countries are disproportionately affected.^[1] Consequently, orthopaedic trauma care is a common focus of international orthopaedic outreach.

Interest in global health has progressively risen among medical trainees, and participation in IHEs has become a mainstay of

many training programs.^[2] Several studies have demonstrated a strong desire among orthopaedic residents to participate in IHEs during their training, with up to 85% of residents expressing interest in these opportunities.^[3–6] Potential benefits to trainees participating in IHEs are extensive and well reported.^[2,7–10] These benefits include improved clinical judgement and skills, optimization of limited resources, increased cultural awareness, long-term commitment to care for the underserved, and development of professional relationships with international providers.

Compared with residents from other medical specialties, orthopaedic surgery residents have a relatively low rate of participation in IHEs during training, and only 12% to 32% of orthopaedic programs offer an organized international elective experience.^[3,11,12] With an increasing number of graduating residents seeking fellowship training in orthopaedic trauma, there may be opportunities for early exposure to the care of musculoskeletal injury in resource-limited settings. To our knowledge, no previous study has examined IHE opportunities during orthopaedic trauma fellowship training. This study aimed to identify the availability of IHEs among US orthopaedic trauma fellowship programs and to describe specific characteristics related to the logistics and implementation of such programs. Additionally, we sought to understand PDs' opinions of the educational value of IHEs and identify potential barriers to IHE participation during orthopaedic trauma fellowship training.

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2. Methods and materials

2.1. Survey development

A 29-question survey was developed using the REDCap system (REDCap, INC, Nashville, Tennessee), a secure, web-based application designed to support data capture for research studies. The survey was modeled after the survey questions described in the 2013 study by Clement et al.^[3] Institutional Review Board approval for the current study was granted.

2.2. Survey distribution and follow-up

The survey link was sent via e-mail, using information publically accessible on the OTA website, to the fellowship PDs of all 54 US orthopaedic trauma surgery fellowships. Two follow-up e-mails were sent at 2-week intervals for the first month. Finally, follow-up e-mails were sent to the cohort of nonresponding fellowship PDs and those who had only partially completed the survey.

2.3. Survey questions

The survey asked basic questions related to the structure of and opinions surrounding IHEs for trauma fellowship trainees. PDs were asked whether or not a structured global health program existed within their respective orthopaedic department or fellowship curriculum. PDs were also asked if any fellows over the past 10 years had participated in an IHE during fellowship training. Programs that offered structured global health programs or had fellow participation in an IHE over the past 10 years were further prompted to complete the full survey. This portion of the survey explored the characteristics of the IHEs and asked logistical questions related to fellow participation in these programs, such as how programs with structured IHEs were able to fund such programs. Finally, all PDs were asked about their opinions of the value of IHEs for orthopaedic trauma trainees and any perceived barriers to implementing a structured global health program at their institution. As the survey was only distributed to PDs of established trauma fellowship programs, the specific experiences of fellows in these programs were not queried. The complete survey is included in Appendix A, <http://links.lww.com/OTAI/A0>.

3. Results

There was an overall response rate of 80%, with 43 of the 54 PDs completing the survey. The responding programs account for 85% (69/81) of the available US orthopaedic trauma fellowship training positions.

3.1. Structured global health programs and fellow participation in IHEs

Only 3 of 43 responding programs (7%) reported having a structured global health program available for orthopaedic trauma fellows. In addition to these 3 programs, 5 of the remaining 40 programs (12.5%) reported fellow participation in

an IHE over the past 10 years. Of these 5 programs, one involved a coordinated response to a specific disaster event (2010 Haiti Earthquake) and was not a recurring or continually available opportunity. Overall, therefore, 7 of the 43 responding programs (16%) offer either a structured global health program or the opportunity for IHE participation during fellowship training. All programs reported IHE duration of 2 weeks, and fellows were permitted to undertake these opportunities at any time during their fellowship training. Participating fellows used a combination of elective, clinical, education, and vacation time for participation in their IHEs.

3.2. Project locations and selection

Among the 7 fellowship programs with structured global health programs or recent fellow IHE participation, countries visited include Kenya, Tanzania, El Salvador, Honduras, Nicaragua, Peru, China, Nepal, and Vietnam. Four of these programs indicated that fellows travel to the same site or country, 2 programs allow choice from a predetermined list of electives, and 1 program requires fellows to seek out opportunities independently.

Among the 3 orthopaedic trauma fellowship programs with structured global health programs, 1 is a partnership between Vanderbilt University (2 fellowship positions per year) and a teaching hospital in Kenya. Funding is provided by donations from fellowship program alumni. Although this partnership has recently been established and is yet to send its first fellow abroad, a faculty member has made several trips and is available to supervise fellows while overseas. Another global health program involves a partnership between Indiana University (2 fellowship positions per year) and hospitals in China and Kenya. Since this program was established 2 years ago, 3 of the 4 fellows have traveled overseas, and faculty members have accompanied the fellows while abroad. Indiana University has utilized department funds to support fellows' travel overseas. The third program is an established partnership between a hospital in Honduras and the Orthopaedic Trauma Surgeons of Northern California program (1 fellowship position per year). Since the establishment of this partnership 2 years ago, both fellows have traveled to Honduras and were accompanied by 1 to 2 faculty members. Departmental funds are used to cover expenses for fellows to travel abroad.

3.3. PD perspectives on value of IHEs during fellowship

Among the 7 programs with recent fellow IHE participation, 100% (7/7) of PDs believed that their fellows were satisfied with their IHEs (Table 1). Similarly, all PDs believed that the educational experience provided by their fellows' IHE participation was valuable (Table 2). A majority of PDs (22/41, 53.6%) agree at least somewhat that global health experiences play a major role in shaping the future professional and volunteer activities of their fellows. Around 22% of PDs (9/41) disagreed with this statement, and the remaining 24.4% indicated a response of neutral/undecided (see Table 2).

Among programs without a structured global health program and with no recent fellow IHE participation, 77% (27/35) of PDs

Table 1

Fellow satisfaction with IHEs, as perceived by PDs (among programs with recent IHE participation).

Not at all satisfied	Somewhat dissatisfied	Neither satisfied nor dissatisfied	Somewhat satisfied	Extremely satisfied
0	0	0	17% (1/7)	83% (6/7)

Table 2
PD perspectives on the value of IHEs during fellowship training.

	Strongly disagree	Somewhat disagree	Neutral/undecided	Somewhat agree	Strongly agree
As a PD, I believe the educational experience provided by my fellow's recent IHE participation was valuable.	0	0	0	29% (2/7)	71% (5/7)
Does IHE participation have a major influence on fellows' future volunteer and professional activities?	9.8% (4/41)	12.2% (5/41)	24.4% (10/41)	29.2% (12/41)	24.4% (10/41)

reported that they have not considered instituting a structured global health program for their fellows. A total of 9% of PDs (3/35) indicated that they have plans to start a structured global health program in the near future, and one program is still considering the idea.

3.4. Perceived barriers to providing fellows with IHE opportunities

Lack of funding was the most prevalent barrier to provide fellows with an IHE during fellowship training, which was cited by 66% of responding PDs (Fig. 1). Lack of established partner sites and concern for clinical coverage with an absent fellow were considered barriers by 51% of PDs. Around 27% of PDs felt that travel abroad might compromise the educational opportunities available to the fellow at the home institution, and 7% of PDs believed IHE participation was simply not a goal of the fellowship program or part of the mission of fellowship training. Other perceived barriers included lack of fellow interest by 27% and lack of insurance coverage by 5%.

4. Discussion

This study aimed to investigate the availability and characteristics of global health opportunities among US orthopaedic trauma fellowship programs. We also aimed to explore PDs' opinions of the educational value of these experiences and to identify barriers to IHE participation among orthopaedic trauma fellows. Our study demonstrates limited global health opportunities but high rates of perceived satisfaction among participating fellows. Furthermore, we identified several significant barriers to IHE implementation.

First and foremost, our study identified limited opportunities for IHE participation during orthopaedic trauma fellowship, with only 7% of responding programs (3/43) having a structured global health program in place. An additional 12% (5 of the remaining 40 programs) reported participation in an IHE by at least one of their fellows over the last 10 years. These results indicate that IHE availability during orthopaedic trauma fellowship training is substantially lower than IHE availability during orthopaedic residency training, in which 12% to 32% of programs offer an organized IHE.^[3,11,12] The short, 1-year duration of fellowship training introduces logistical challenges to participation in an IHE, challenges that are not felt as acutely during a 5-year residency training program. Despite the low rate of current fellow IHE participation, 9% of responding programs expect to institute a structured global health program in the near future, which may lead to greater opportunities for IHE participation during orthopaedic trauma fellowship training in the coming years.

Our survey also demonstrates high rates of satisfaction with IHE participation. While we were unable to contact participating fellows directly to further explore details of their IHE experiences, all responding PDs stated the perceived satisfaction of their fellows was high. The structured global health rotation offered by the Orthopaedic Trauma Surgeons of Northern California fellowship program indicated that fellows have found their experiences abroad to be "extremely rewarding." The trainee benefits of IHE participation are highly touted and have been explored thoroughly in the literature.^[2,7-10] In 1 study, 1/3 of residents highlighted improved knowledge in use of limited resources as a critical part of their learning experience.^[8] Increased cultural awareness, improved communication skills, and development of systems-based knowledge have been cited in

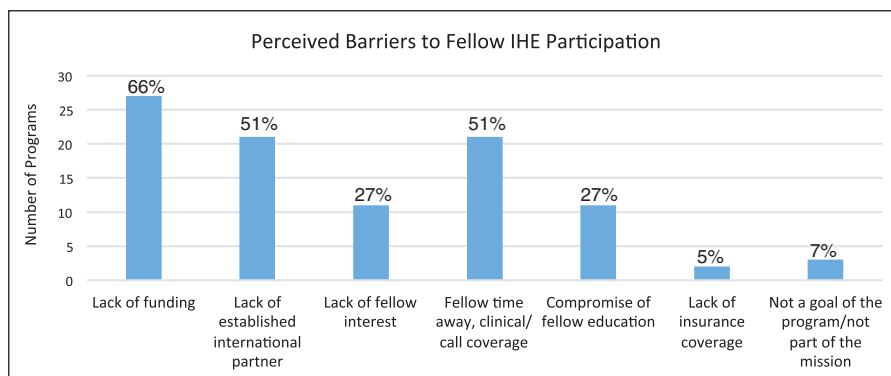


Figure 1. PDs' perceived barriers to fellow participation in an IHE.

multiple surveys as important lessons gained from IHEs.^[2,9,10] One specific PD response from our survey indicated that IHE participation provides the opportunity “to practice in an environment in which creativity is required for nearly every step.” With regard to improvement in surgical skills, various studies have reported positive results. In a study of plastic surgery residents, 90% of IHE participants reported improved operative skills and the ability to adapt in the operating room.^[10] In another study, 89% of evaluators found increased surgical competence in residents returning from an IHE.^[13]

Previous studies investigating IHEs during orthopaedic residency have shown high rates of satisfaction among participants.^[2,8–10] In 1 study, up to 96% of residents reported a very good or excellent experience.^[3]

Participation in an IHE may also have an influence on the future direction of a trainee’s career. Fellow participation in IHEs can help to establish close personal and professional relationships with local surgeons which may foster mutually beneficial long-term partnerships. A study of plastic surgery residents who participated in a global outreach fellowship demonstrated that 55% continued to actively participate in international health opportunities, and over 70% continued seeing patients domestically in a volunteer setting.^[10] Participants in the University of California at San Francisco Orthopaedic Residency IHE demonstrated increased volunteerism both domestically and abroad compared with their colleagues who did not participate.^[14] While an IHE experience is certainly valuable to the trainee, the presence of a visiting trainee must not become a burden on the host institution. The presence of the visiting trainee should not compromise opportunities for local trainees, and the IHE should not place an undue burden on the host institution’s resources.^[15] The goal of any IHE in a resource-limited setting should be first and foremost to maximize the benefit gained by the host institution, its providers, and its patients.^[15]

Our study identified multiple barriers to IHE implementation including lack of established international partner sites, lack of funding, and issues with clinical and call coverage due to fellow absence. Half of the respondents in our survey reported that lack of an established international partner institution was a significant barrier. This is in keeping with previously published literature; Clement et al^[3] demonstrated that among orthopaedic residency programs offering IHEs, only 50% had an ongoing relationship with an international site. Establishment of a structured international health elective is a process that requires a significant commitment of time and resources. Two of the 3 structured global health programs identified by our survey (Vanderbilt University and Indiana University’s Kenya site) represent multidisciplinary partnerships between the US-based institution and the institution abroad. In both cases, pre-existing partnerships between the US and African institutions, launched by other medical specialties/departments, set the stage for the establishment of the structured global health programs offered by these orthopaedic trauma fellowship programs. For PDs interested in forming a structured global health program for fellows, consideration should be given to exploring existing global health partnerships between the home institution and institutions abroad.

The role of nongovernmental organizations in assisting with the establishment of sustainable, mutually beneficial international relationships has also been well described.^[11,16,17] Health Volunteers Overseas (HVO) has been a leader in this regard, strengthening local surgical capacity through collaboration and knowledge exchange for decades.^[17] The UCSF residency

program has previously published their process of establishing a structured IHE with the assistance of HVO.^[18] This is a model that may be replicated by fellowship programs citing lack of established international partner sites as a significant barrier.

In our study, 67% of programs reported lack of funding as a significant barrier to fellow participation in an IHE. In a recent study, 90% of residency programs identified limited funding as a significant barrier to implementing an IHE.^[3] Hoehn et al^[19] estimated the University of Cincinnati general surgery program spent \$24k to establish an international elective, and the estimated cost of a 2-month rotation was nearly \$18k. In order to more reliably offer IHE opportunities to trainees, further sustainable funding options must be identified. While a majority of residency programs provide at least some funding, most trainees pay at least a portion of the cost of their experiences abroad.^[3] Zhang et al^[4] demonstrated that 74% of orthopaedic residents are willing to fully or at least partially fund their IHEs. Through HVO, scholarships to defray a large portion of the cost of an IHE are available to senior orthopaedic residents and fellows.^[20]

Nearly half (49%) of responding PDs in our study reported clinical/call coverage issues or issues with fellows’ time away from the program as barriers to fellow IHE participation. Additionally, roughly 27% of PDs believe IHE participation may compromise a fellow’s educational experiences at the home institution. Given the short duration of fellowship training, a 2-week experience abroad represents a significant commitment. The potential benefits to the trainee and the host institution from participation in an IHE must be weighed against the potential risks of missing certain educational opportunities at a fellow’s home institution. Three separate PDs indicated that IHEs are simply not a primary goal of their fellowship training programs. The decision to include an IHE as part of the educational curriculum of an orthopaedic trauma fellowship program must be made by each PD, taking into account the specific goals of the training program, the potential benefits/costs of IHE participation, and any available institutional resources.

5. Limitations

There are several important limitations to our study. As our primary data consisted of PDs’ responses to our e-mail-based survey, many of the specifics and details of available IHEs remain unexplored. Nonetheless, our survey contributes valuable information to the growing body of literature exploring global health opportunities available to orthopaedic trainees. Specifically, the responses gathered from fellowship programs with a structured global health program may provide other PDs with useful guidance in establishing a similar program for their fellows. Furthermore, our high survey response rate (80%) should substantially limit the potential for selection bias.

Our study focused almost exclusively on IHEs from the perspective of the trainee. There is a paucity of orthopaedic literature exploring the impact of IHEs and volunteerism on the host institution. Further studies investigating the impact of these experiences on host institutions may help improve the collaborative and mutually beneficial nature of IHEs. It is important to ensure that the focus of an IHE includes demonstrable benefits to the host community and institution.

6. Conclusion

High rates of interest in IHE participation among orthopaedic residency trainees suggest that the demand for IHEs during

orthopaedic fellowship training will likely continue to rise. Our survey identified high rates of fellow satisfaction and PD-assessed educational value associated with IHE participation during orthopaedic trauma fellowship training. Although many barriers exist to the establishment of a structured global health program for orthopaedic trauma fellows, interested PDs should explore all available resources including well-established NGOs and existing institutional global partnerships.

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